

# 10M11CI113: Advanced Database System

**Course Credit: 3**

**Semester: M.Tech, I**

## **Introduction**

This course aims to provide a gentle and application-oriented introduction to all Topics. Motivation and application-development considerations, rather than state-of-the-art research, are the main focus. Examples are extensively used in the text, and a brief selected reading section appears at the end of each chapter for readers who want more information. Special attention is given to the design issues raised by the new trends. Students have to solve 7 assignments which includes research papers of advanced database technologies

## **Course Objectives (Post-conditions)**

### **Knowledge objectives:**

1. You will understand the basic Transaction Management in Databases e.g.Concurrency, Recovery, and differnt protocols).[Familiarity]
2. You will understand the concepts of Query processing and Query Optimization. [Familiarity]
3. You will know the important Single, Multilevel dynamic Indexing. [Familiarity]
4. You will know the Data warehouse and Data mining. [Familiarity]
5. You will understand the basic Parallel and Distributed Databases. [Familiarity]
6. You will know the various emerging database technologies like Multimedia databases, GIS database and Bioinformatics databases[Familiarity]
7. You will know the various non relational database like Active databases, deductive database and temporal databases[Familiarity]
8. You will learn the methods of concurrency control in Database. [Assessment]

### **Application objectives:**

1. Apply appropriate known concurrency control techniques for a given scenario. [Usage]
2. You will be able to analyze the various recovery mechanism.[Usage]
3. You will be able to design a best query evaluation Plan .[Usage]

## **Expected Student Background (Preconditions)**

Introduction to Database Systems, Discrete Mathematics, Computer Programming and Data Structure

## **Topics Outline:**

S.No.	Topics	Hrs.
1	Evolution and trends of Database Technology	2
2	An introduction to conceptual modeling of Information System	2
3	Transaction Management: Concurrency Control and Serializability; Recoverability and Strictness; Two-phase locking; Two-phase commit	8

4	Query Processing and Optimization: (a) Relational algebra transformations (b) Query size and I/O cost estimation (c) I/O cost for basic data management algorithms	7
5	Advanced Indexing and Query Processing, Multi-dimensional Index Structures	5
6	Data Warehouse Design and Implementation	4
7	New Topics and Applications, e.g., (a) Information Retrieval (b) Bioinformatics (c) Incomplete and Uncertain Databases (d) Non-relational Databases, (e) Data Stream Management	7
8	Scalable Data Storage, Parallel and Distributed Databases Database Performance Buffer and Storage Management	7
	Total	42

## **References**

1. Database system concepts” Henry F Korth, Abraham Silberschatz, S. Sudurshan, McGraw-Hill
2. An Introduction to Database Systems C. J. Date, , Addison-Wesley Longman Publishing Co., USA
3. Advanced Database Technology and Design “Mario Piattini and Oscar Diaz” ,Artech House Boston London.
4. "Fundamentals of Database Systems" Elmasri, Navathe, Pearson Education.
5. Bipin C Desai, An Introduction to Database Systems?Galgotia. Publications Pvt Limited, 2001
6. “An Introduction to Database Systems”, C.J.Date, Pearson Education.
7. “A first course in Database Systems”, Jeffrey D. Ullman, Jennifer Windon, Pearson, Education.
8. “Data Management: databases and organization”, Richard T. Watson, Wiley.
9. “Data Modeling Essentials”, Graeme C. Simxion, Dreamtech.
10. Introduction to Data Base Management, Naveen Prakash, Tata McGraw Hill
11. “Database Systems: A Practical Approach to design, Implementation and Management”. Thomas Connolly, Carolyn Begg; Third Edition, Pearson Education.

**Evaluation Scheme:**

S.No	Examination	Marks
1	T-1	15
2	T-2	25
3	T-3	35
4	*Internal Marks	25

\*Internal Marks Breakdown:

Assignments            9 marks (3x3)

Quizzes                12 marks (3x4)

Regularity            4 Marks